

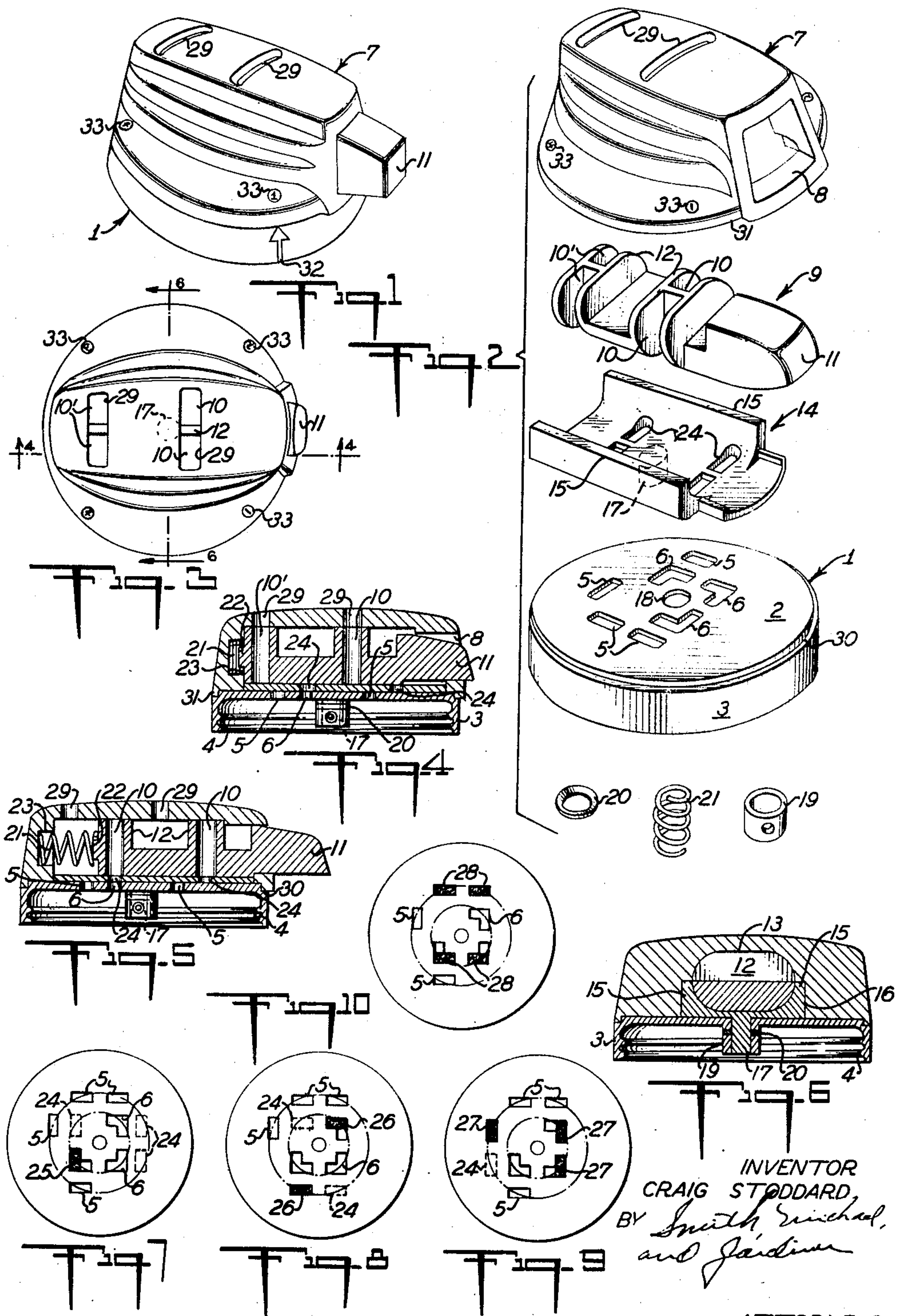
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DISPENSING CAP

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ATTORNEYS.



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2,710,118

## DISPENSING CAP

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13 Claims. (Cl. 222—266)

This invention is a dispensing cap for use in connection with containers such as jars, cans, and the like, and is operable to dispense predetermined, measured quantities of powdered or granular material from such containers.

One object of the invention is to provide a dispensing means of the character described wherein the measured quantity of material to be dispensed may be varied within predetermined limitations.

Another object of the invention is to provide in a dispensing apparatus of the character described, a plunger provided with plural material-receiving chambers or compartments, and wherein the dispensing cap is provided with a plurality of filling openings for the plunger, the plunger being movable so that any desired number of material-receiving chambers in the plunger may be placed in registration with a corresponding number of filling openings in the cap.

Another object of the invention is to provide in a dispensing apparatus of the character described, a cap provided with plural, circular series of filling openings and a reciprocable plunger mounted on the cap and having a plurality of material-receiving chambers so positioned that in one longitudinal position of the plunger, the same may be rotated about an axis passing through the cap to selectively bring into registration with a desired number of compartments in the plunger, a corresponding number of filling apertures in the cap, to thereby vary the number of compartments filled and thus vary the measured amount of material to be dispensed at each operation of the plunger.

These and other objects of the invention will become apparent from reading the following specification in the light of the accompanying drawings wherein there is illustrated a preferred embodiment of the invention.

In the drawings,

Fig. 1 is a perspective view of the invention,

Fig. 2 is an exploded view of the invention, with the parts thereof shown in perspective.

Fig. 3 is a plan view of the invention with the plunger in discharging position,

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 3,

Fig. 5 is a view corresponding to Fig. 4 with the plunger in its normal filling position,

Fig. 6 is a cross-sectional view taken on the line 6—6 of Fig. 3, and

Figs. 7, 8, 9, and 10 are diagrammatic views showing the relative position of the filling apertures and chambers in various positions of the plunger.

In the accompanying drawing like reference numerals are used to designate like parts throughout.

The dispensing cap of the present invention may be made of metal or synthetic resin or any suitable, moldable material, but it is preferable to make it of a transparent or semi-transparent material such as Lucite or Vinylite. The invention comprises a base member indicated generally at 1, said base member comprising a plate-like member 2 having a depending, peripheral flange 3. The

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flange 3, as clearly shown in Figs. 4, 5, and 6, may be interiorly threaded as at 4 so that the base member and associated parts may be applied to the discharge opening of a container such as a jar or can, not shown. It will be understood that while the plate 2 has been shown provided with the interiorly threaded flange 3, the invention may include the plate 2 without an integral flange 3 as shown, but in lieu thereof a separate ring element, internally threaded, may be employed as is conventional in closures, etc.

The plate 2 is provided with a plurality of filling openings or apertures 5 and 6, more clearly shown in Fig. 2, and as indicated more clearly in the diagrammatic views, 7, 8, 9 and 10, the openings 5 and 6 are arranged in circular series, for a purpose to be described later herein.

There is provided a cover member indicated generally at 7 which is mounted for rotation on the base member 1. The cover member is provided with a laterally directed opening 8. Mounted within the cover member 7 is a plunger member 9, said plunger member being provided with a plurality of material-receiving chambers or compartments 10—10 and 10'—10'. The compartments 10—10 and 10'—10' are arranged in pairs and disposed symmetrically with respect to the longitudinal axis of the plunger 9. The plunger is mounted within an upstanding hollow portion of the cover 7 as shown in Figs. 4 and 5, and the dimensions of the plunger member 9 are designed so that the plunger may be reciprocated longitudinally within the cover member. The plunger member 9 is provided with a finger portion 11 which as shown in Figs. 1 and 5 normally projects through the opening 8 of the cover member so that the plunger may be reciprocated within the cover member by pressure of an operator's finger thereon. As shown in Figs. 5 and 6, the cross-sectional dimensions and contours of the plunger 9 are designed to make a snug, sliding fit with the inner wall of the cover member 7. Thus, the plunger 9 is provided with partitions 12 which slidably engage the inner wall surfaces 13 of the cover member. The plunger member 9 is enclosed within the cover member 7, and within the plunger-receiving compartment thereof, by separate bottom wall member indicated generally in Fig. 2 by the reference character 14. The bottom wall member 14 is provided with upstanding, lateral edges 15 which fit within a recess 16 provided in the cover member 7, and the inner surfaces of said wall member are contoured to correspond to the contours of the partition members 12 of the plunger 9 as clearly shown in Fig. 6. The separate wall member 14 is provided with a pin or stub shaft 17 by which the cover member with its assembled plunger member 9 and bottom wall member 14 may be mounted upon the base member 1 for rotation with the pin or shaft 17 threaded through a central aperture 18 in the base member 1. The parts may be thus retained in assembled relation by applying a suitable securing collar 19 to the free end of shaft 17 by a set screw, not shown. A spring washer 20 may be interposed between the collar 19 and the underface of the plate 2 of the base 1 as clearly shown in the sectional views 4, 5, and 6. The plunger member 9 is biased to projected position as shown in Fig. 5 by coil spring 21 positioned between the rear end of the plunger 9 and an opposed wall of the cover member 7. As shown in Figs. 4 and 5, the spring 21 may be maintained in proper position by a projection 22 on the rear end of the plunger 9 and a socket or recess 23 in the rear wall of the cover member 7.

The separate wall member 14 is provided with a plurality of openings or apertures 24 in its bottom portion, said apertures being positioned symmetrically with respect to the longitudinal axis thereof and to lie in registry with the material-receiving compartments 10—10, 10'—10' of the plunger 9 when the latter is in its normal projected



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position as shown in Fig. 5. When the plunger 9 and the spring 21 are assembled within the cover member 7, the separate wall member 14 may be placed in position as shown and secured therein by any desired means such as the application of adhesive, not shown, around the meeting edges of said wall member and the abutting surfaces of the cover member 7, so that the cover member and the separate wall member 14 form within the cover member a plunger-receiving compartment within which the plunger 9 is longitudinally reciprocable transversely of the axis of rotation of the cover member, which axis passes through the pin or shaft 17.

As previously mentioned, the filling apertures 5 and 6 in the plate-like member 2 of the base member 1 are arranged each in a circular series. These circular series are concentrically arranged in respect to the axis of rotation of the cover member 7 and the enclosed plunger 9. With this in mind, the compartments or chambers 10—10 and 10'—10' of the plunger 9 are arranged in definite, predetermined relation, namely, they are positioned longitudinally of the plunger 9 in a manner such that when the plunger is in normal projected position as shown in Fig. 5, the distances that the compartments 10—10 and 10'—10' are displaced from the axis of rotation of the cover 7 are equal, respectively, to the radii of the circular series of filling openings 5—5, 6—6. As previously stated, the openings 24 in the separate wall member 14 are positioned to be always in registration with the chambers 10—10 and 10'—10' when the plunger is in the position shown in Fig. 5. Thus, it is apparent that as the cover 7 and plunger 9 are rotated as a unit about the axis of rotation passing through the pin 17, any desired number of the openings 24 of the separate wall member 14 and the aligned compartments 10—10, 10'—10' of the plunger may selectively be placed in registration with a corresponding number of the filling openings 5—5, 6—6 as shown in the diagrammatic views 7 to 10 inclusive. Referring more particularly to the diagrammatic views 7 through 10, it will be noted that the openings 5 and 6 are shown in full lines, whereas the openings 24 are illustrated in dotted lines, and where one or more openings are in registration, the cross-sectional area of the registered openings is shown stippled. Thus, in Fig. 7, one opening 24 is aligned with one opening 6, as shown by the stippled area 25. By relatively rotating the cover member 7 through 90°, the apertures assume the position shown in Fig. 8 wherein two of the apertures 24 are in registration, respectively, with an aperture 6 and an aperture 5, as shown by the stippled areas 26. In Fig. 9, the parts are shown after a further rotation of the cover member 90° in a counterclockwise direction, as the result of which, three of the apertures 24 are brought into registration with selected apertures 5 and 6 to provide three such registered openings as shown at 27. In Fig. 10, the cover is shown in the position after a further rotation of 90° as the result of which all four openings 24 have been brought into registration with a similar number of filling openings, there being two of the openings 6 and two of the openings 5 in registration with the openings 24 as shown by the four stippled areas 28.

Having in mind that the openings 24 in the separate wall member 14 are always in registration with the respective compartments 10—10 and 10'—10' of the plunger when the plunger is in its normally projected position as shown in Fig. 5, it is apparent that by selectively placing one, two, three, or four of the openings in registration with a corresponding number of the filling openings 5 and/or 6, a corresponding number of the compartments 10—10, 10'—10' may be filled simultaneously.

In order to discharge the contents of any filled compartments, the cover member 7 is provided with discharge opening means 29, said openings, as shown in Fig. 4, being in alignment with the respective material-receiving compartments 10—10, 10'—10' of the plunger 9. Thus, regardless of how many of the compartments

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10—10, 10'—10' have been filled, all of the filled compartments may simultaneously be discharged by movement of the plunger 9 to the position shown in Fig. 4 wherein all of the plunger compartments are in registration with the discharge openings 29 of the cover.

In order to maintain the cover member and the base member when assembled in snug nesting relationship, the base member 1 may be provided with a peripheral, annular shoulder 30 within which a depending peripheral edge 31 of the cover member 7 may seat. If the plate member 2 of the flange or ring 3 are made separately as previously suggested, the annular shoulder 30 may be provided on the separate ring member.

In order to give to an operator the proper indication as to how many of the compartments 10—10, 10'—10' and the aligned openings 24 in the separate wall member 14 are in registration with filling openings 5 and/or 6 of the base member, the base member may be provided with an arrow such as 32, and the cover member may be provided with cooperating indicia such as 33 so that when the arrow is in alignment with one of the index elements 33, an operator may know that there are one, two, three, or four of the plunger compartments in position to be filled.

In conclusion, it is apparent from the foregoing specification that the novel dispensing cap herein disclosed comprises a trap chamber plunger member mounted for reciprocation and rotation on a base member and wherein the trap plunger may be selectively positioned in respect to a desired number of filling openings, so that a corresponding number of chambers provided in the plunger may be simultaneously filled and the plunger then moved to a position to simultaneously discharge all of the filled chambers. It will, of course, be understood that the dispensing cap is secured to the mouth or discharge opening of a jar or similar container having a quantity of granular or powdered material therein, and that the said material may be dispensed by inverting the container so that the contents thereof are in contact with the underside of the plate-like member 2 of the dispensing cap so that the contents of the container may readily pass through such of the apertures 5 and 6 as are in registration with selected openings 24 and aligned compartments 10—10, 10'—10', as described.

It will be understood that the invention as illustrated in the accompanying drawings is for the purpose of example only and that such changes may be made in the size and proportion of all parts without departing from the spirit of the invention, which is set forth more particularly in the appended claims.

I claim:

1. A dispensing cap for containers comprising a base member provided with a plurality of filling apertures in a fixed pattern, a cover member mounted on said base member for rotation about an axis generally perpendicular to the plane of the base member, a plunger positioned between the base member and the cover member, said plunger being operatively connected with the cover member for rotation therewith, said plunger being also mounted for longitudinal reciprocation transversely of the axis of rotation of the cover member, said plunger being provided with a plurality of chambers in a second fixed pattern and arranged so that when the plunger is in a predetermined longitudinal position, a selected number of said chambers may, by rotation of the cover member and plunger, be placed in registration with a corresponding number of said filling apertures, and discharge opening means provided in said cover member with which all of the chambers are in registration when the plunger is moved to another predetermined longitudinal position.

2. The dispensing cap described in claim 1 wherein said filling openings in the base member include a circumferentially-spaced circular series of openings, and wherein certain of said chambers in the plunger are displaced from the axis of rotation of said cover member when the



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plunger is in said first-mentioned, predetermined position, a distance corresponding to the radius of said circular series of openings in the base member, said circular series of openings being disposed concentrically with respect to the axis of rotation of the cover member.

3. The dispensing cap described in claim 1 wherein the filling apertures in the base member comprise plural, concentric, circumferentially-spaced, circular series of apertures, and wherein the chambers in said plunger include chambers which, when the plunger is in said first-mentioned longitudinal position, are displaced from the axis of rotation of said cover member distances corresponding, respectively, to the radii of said concentric circular series of apertures.

4. The dispensing cap described in claim 2 wherein the chambers provided in said plunger are arranged in the plunger symmetrically with respect to the longitudinal axis thereof.

5. The dispensing cap described in claim 3 wherein the chambers provided in said plunger are arranged in pairs, spaced longitudinally of the plunger, and wherein the chambers of each pair are symmetrically disposed with respect to the longitudinal axis of the plunger.

6. A dispensing cap comprising a base member provided with a plurality of filling apertures in a fixed pattern, a cover member mounted on said base member for rotation, means defining a plunger-receiving chamber within said cover member, a plunger mounted within said chamber for longitudinal reciprocation therein transversely of the axis of rotation of the cover member, said plunger being provided with a plurality of chambers, the wall of the plunger-receiving chamber being provided with openings in a second fixed pattern which, in one predetermined position of the plunger are respectively in registration with the chambers of the plunger, said cover member being provided with discharge opening means with which all of said plunger chambers are in registration in another predetermined position of said plunger, the first and second fixed patterns being such that a selected number of said openings may be placed in registration with a corresponding number of the filling apertures in said base member by rotation of the cover member on said base member, said openings in said wall of the plunger-receiving chamber being out of registration with the trap chambers in said other predetermined position of the plunger.

7. The dispensing cap described in claim 6 wherein the wall of the plunger-receiving chamber having said openings is provided with a pin which extends through a central aperture in the base member, and means on said pin for securing the base member and cover member together for rotation about an axis passing through said pin.

8. The dispensing cap described in claim 6 wherein the base member is provided with an annular, peripheral shoulder and wherein the cover member is provided with a depending, peripheral edge portion embracing said shoulder whereby to maintain the members in proper alignment for rotation.

9. A dispensing cap provided with plural circular series of filling apertures, a reciprocating plunger having plural chambers therein mounted on said cap for rotation about an axis generally perpendicular to the plane of the cap,

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said chambers being longitudinally spaced along said plunger so that when the plunger is in one predetermined position, said chambers are displaced from the axis of rotation distances equal, respectively, to the radii of said circular series of apertures, said filling apertures and said trap chambers being arranged in fixed patterns whereby a selected number of said chambers in the plunger may be placed in registration with a corresponding number of filling apertures in the cap by rotation of the plunger with respect to the cap, and discharge means in said cap for simultaneously discharging the contents of all of said chambers when the plunger is moved to another predetermined position, said trap chambers and said filling apertures being out of registration in said second mentioned predetermined position of said plunger.

10. A dispensing cap comprising a plate member having a series of filling apertures in a first fixed pattern therein, a cover member mounted on the plate member for rotation, a plunger mounted between the plate member and cover member for reciprocation transversely of the axis of rotation of the cover member, a plurality of open ended compartments in a second fixed pattern provided in said plunger and disposed therein so that the respective open ends of a selected number of said compartments may be positioned in registration with a corresponding number of said filling apertures in the plate member when the cover member is rotated on said plate member with the plunger in one predetermined, longitudinal position and discharge means provided in said cover member for simultaneously discharging all of said compartments when the plunger is moved to another predetermined, longitudinal position, said compartments and said filling apertures being out of registration in said other predetermined position of the plunger.

11. The dispensing cap described in claim 10 wherein means are provided for biasing the plunger to said first-mentioned, predetermined, longitudinal position, and wherein the plunger is provided with means accessible from the exterior of the cover member for moving the plunger to said second-mentioned, predetermined, longitudinal position against the force of said biasing means.

12. The dispensing cap described in claim 9 wherein the pattern of the circular series of filling apertures such that they are disposed concentrically with respect to the axis of rotation of the cover.

13. A dispensing cap comprising a base member, a trap chamber member provided with a plurality of trap chambers arranged in a predetermined pattern, said base member being provided with plural filling apertures arranged in a second predetermined pattern, means mounting the trap chamber member and said base member for relative movement, said patterns being such that a selected number of said trap chambers may be placed in registration with a like number of filling apertures, and means for simultaneously discharging the contents of all trap chambers.

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